UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA

- v. -

BASHER QAYYEM,
Defendant.

10 Cr. 19 (KMW)

OPINION & ORDER

Pursuant to a written plea agreement, Defendant Basher Qayyem ("Qayyem") pled guilty to one count of conspiracy to distribute and possess with intent to distribute 3,4-methylenedioxymethamphetamine ("MDMA"), commonly known as ecstasy, and 1-benzylpiperazine ("BZP"), in violation of 21 U.S.C. §§ 841 and 846. Qayyem argues that prior to imposing sentence, this Court must resolve two issues: (1) whether the current 500:1 marijuana equivalency[1] for MDMA set forth in the United States Sentencing Guidelines ("the Guidelines") is too harsh in light of recent research on the harmful effects of MDMA relative to other drugs; and (2) whether BZP, a Schedule I controlled substance not specifically referenced in the Guidelines, is most closely related to MDMA, a referenced controlled substance, when combined with 3-Trifluoromethylphenylpiperazine ("TFMPP"), a noncontrolled substance.[2]

For the following reasons, the Court finds that the 500:1 marijuana equivalency prescribed by the Guidelines for MDMA-related offenses is greater than necessary to serve the objectives of sentencing, and it instead adopts a 200:1 marijuana equivalency. It also finds that the referenced controlled substance that is most closely related to a combination of BZP and

[1] The concept of marijuana equivalency was established by the United States Sentencing Commission in order to set penalties in cases involving multiple drugs with differing penalty levels. The penalties for offenses relating to marijuana are used as a common standard to which all other drugs are related mathematically, often expressed in the form of a ratio.
[2] Qayyem has not requested that the Court conduct an evidentiary hearing on either issue.

TFMPP is MDMA.

I. Background

On October 2, 2009, Qayyem was arrested for his involvement in three separate transactions in which a co-conspirator sold pills containing MDMA and pills containing BZP to a confidential source through controlled buys conducted by the Drug Enforcement Administration ("DEA"). In the first transaction, the confidential source purchased three pills, which, after being sent to a DEA laboratory for testing, were determined to consist of .73 grams of MDMA. In the second transaction, the confidential source bought 515 pills determined to contain 153 grams of BZP. In the third transaction, the confidential source purchased an additional 540 pills consisting of 160 grams of BZP. The lab reports issued by the DEA stated that the pills containing BZP also contained TFMPP, a noncontrolled substance.[3] On July 5, 2011, Qayyem pled guilty to one count of conspiracy to distribute and possess with intent to distribute a total of .73 grams of MDMA and 313 grams of BZP.

II. Determining the Appropriate Marijuana Equivalency for MDMA

A. Applicable Law

Under *United States v. Booker*, 543 U.S. 220 (2005), the Guidelines are only advisory. A district judge must consider the range prescribed by the Guidelines as one factor among several when determining an appropriate sentence, but she "may determine that, in the particular case, a within-Guidelines sentence is greater than necessary to serve the objectives of sentencing."

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[3] The precise amount of TFMPP contained in the pills is unknown. According to Qayyem, TFMPP is not measured by any lab because it is a noncontrolled substance. (*See* Def. Ltr. re: Sentencing, dated Nov. 21, 2011 (hereinafter "Def. Mem."), at 5.) The Government, which has not submitted a sentencing memorandum in this case, has not responded to this point, but Qayyem states that the Government conceded this to be the case at the sentencing of Qayyem's separately charged co-conspirator, Franklin Vasquez. *United States v. Vasquez*, 10 Cr. 161 (DC) (April 8, 2011). (*Id.*)

Kimbrough v. United States, 552 U.S. 85, 91 (2005) (internal quotation omitted). A judge may depart from the Guidelines range "based solely on a policy disagreement with the Guidelines, even where that disagreement applies to a wide class of offenders or offenses." *United States v. Cavera*, 550 F.3d 180, 192 (2d Cir. 2008) (citing *Kimbrough*, 552 U.S. at 107-08). In particular, a court is free to reject guidelines that it determines are based "on assumptions about . . . relative harmfulness . . . that more recent research and data no longer support." *Kimbrough*, 552 U.S. at 95, 98 (finding no abuse of discretion where district court imposed a non-Guidelines sentence for crack cocaine offense, based on lack of empirical evidence for 100:1 sentencing disparity between crack and powder cocaine offenses). A district court that disagrees with the Guidelines ratio may replace the ratio with one that, "in [its] judgment, corrects the disparity." *Spears v. United States*, 555 U.S. 261, 265 (2009) ("Put simply, the ability [per *Kimbrough*] to reduce a mine-run defendant's sentence necessarily permits adoption of a replacement ratio.")

B. Current Penalty Structure

Under the Guidelines, the current MDMA-to-marijuana equivalency is 500:1; that is, 1 gram of MDMA is deemed to be equivalent to 500 grams of marijuana for sentencing purposes. *See* U.S.S.G. § 2D1.1 Application Note 10(D). The 500:1 ratio was established in 2001, pursuant to the Ecstasy Anti-Proliferation Act of 2000 ("the Act"), which directed the United States Sentencing Commission ("the Commission") to increase penalties for offenses relating to the manufacture and trafficking of MDMA. Prior to the Act's passage, the Guidelines provided for a 35:1 marijuana equivalency.

The Commission stated that its adoption of a 500:1 marijuana equivalency "reflects the unique pharmacological and physiological harm of ecstasy, the fact that the drug is aggressively marketed to and used by youth, and its importation and trafficking patterns." United States

Sentencing Commission, *Report to the Congress: MDMA Drug Offenses—Explanation of Recent Guideline Amendments* 5 (2001) (hereinafter "Report"). The Commission's decision was guided in part by its determination that MDMA was more dangerous than powder cocaine, which has a 200:1 marijuana equivalency under the Guidelines, but less dangerous than heroin, which has a 1000:1 marijuana equivalency. *See* Report 4-5.

The Commission argued that the penalties for MDMA trafficking should be greater than those for cocaine because: "(1) unlike MDMA, powder cocaine is not neurotoxic, (2) powder cocaine is not aggressively marketed to youth in the same manner as MDMA, and (3) powder cocaine is only a stimulant, but MDMA acts as both a stimulant and a hallucinogen." Report 5. By contrast, the Commission determined that a lesser penalty structure was warranted for MDMA trafficking than for heroin trafficking because:

> (1) there are many more heroin cases in the federal system than MDMA cases; (2) heroin is more addictive than MDMA; (3) heroin has many more emergency room visits and deaths associated with its use than MDMA, because, unlike MDMA, which is generally taken orally, heroin is injected; (4) heroin has more violence associated with both its users and distribution system than MDMA, in part because MDMA users typically do not resort to violence to support their drug use; and (5) heroin causes greater secondary health effects, such as the spread of HIV and hepatitis, because it is injected.

Report 5.

Qayyem argues that the Commission's adoption of the 500:1 MDMA-to-marijuana equivalency was based on "highly selective and incomplete analysis of the information" made available to the Commission, and that research post-dating the Report has further eroded the scientific basis for the Commission's conclusion that MDMA is more than twice as harmful as cocaine. (Def. Mem. at 3.) According to Qayyem, the most recent research indicates that, to the contrary, MDMA is less harmful than cocaine and ranks among the least harmful of many other controlled substances. Qayyem urges this Court to adopt a 100:1 marijuana equivalency, which

he contends will accurately reflect MDMA's harm relative to other drugs, particularly cocaine.

C. Analysis

Qayyem relies primarily on the findings set forth in a recent decision issued in this district, *United States v. McCarthy*, No. 09 Cr. 1136, 2011 WL 1991146, at *1 (S.D.N.Y. May 19, 2011), in which Judge Pauley adopted a 200:1 marijuana equivalency for MDMA-related offenses after conducting an extensive evidentiary hearing to reevaluate the continuing validity of the research upon which the Commission relied. Although this Court has conducted its own review of much of the research, it credits and relies heavily upon the evidentiary findings set forth in *McCarthy*.

As noted, the Commission concluded that MDMA was less harmful than heroin with respect to five factors: (1) the number of cases in the federal system; (2) addiction potential; (3) emergency room visits; (4) violence associated with use and distribution; and (5) secondary health effects. The Commission failed to compare MDMA to cocaine using this same five-factor rubric; had it done so, it would have found that MDMA is also less harmful than cocaine with respect to each factor, with the exception of the fifth factor, secondary health effects, which are similar for MDMA and cocaine. *See McCarthy*, 2011 WL 1991146 at *7. Such a "selective analysis is incompatible with the goal of uniform sentencing based on empirical data." *Id.*

With respect to the number of cases in the federal system, there are approximately twice as many cocaine-related cases in the federal criminal justice system than there are MDMA-related cases. The most recent statistics released by the Bureau of Justice indicate that, in 2009, there were 8,491 DEA arrests for powder cocaine, compared to 4,701 such arrests for methamphetamines. U.S. Dep't of Justice, Federal Justice Statistics, 2009—Statistical Tables 6 (2009), *available at* http://bjs.ojp.usdoj.gov/index.cfm?ty=pbdetail&iid=2374; *see also*

McCarthy, 2011 WL 1991146 at *7 (analyzing similar statistics for 2008).

The data on drug-related emergency room visits is particularly stark. In 2009, 422,896 emergency room visits (43.4%) involved cocaine abuse, whereas 22,816 visits (2.3%) were attributable to MDMA abuse. U.S. Dep't of Health & Human Services, Drug Abuse Warning Network, 2009: National Estimates of Drug-Related Emergency Department Visits 27-28 (2011); *see also McCarthy*, 2011 WL 1991146 at *6 (analyzing comparable statistics for 2007). Even controlling for the fact that cocaine is more widely used than MDMA, as of 2007, the former was approximately 16 times more likely to lead to hospitalization than the latter. *McCarthy*, 2011 WL 1991146 at *6.

As to violence associated with use and distribution, the evidence clearly indicates that cocaine trafficking is associated with higher incidences of violence than is MDMA. The Commission itself acknowledged this in its report, stating that there is a "lower presence of violence associated with MDMA offenses, compared to the violence associated with trafficking of other drugs." Report 19. The Commission noted that, in 1999, "federal offenders sentenced for MDMA trafficking received a sentencing enhancement for weapon involvement in only 1.9 percent of cases, compared to 21.6 percent for crack cocaine trafficking and 12.2 percent for drug trafficking overall." *Id.* Moreover, "unlike users of other drugs, users of MDMA rarely commit crimes to support their consumption patterns." *Id.*

A comparison of cocaine and MDMA on addiction potential also undermines the Commission's findings. At the *McCarthy* evidentiary hearing, experts on behalf of the government testified that not only is cocaine "far more addictive than MDMA," but also that MDMA is "'one of the least addictive drugs.'" *McCarthy*, 2011 WL 1991146 at *6. A 2007 study published in the British medical journal *The Lancet*, submitted by Qayyem as part of his

sentencing memorandum, also supports this conclusion. The study ranked twenty drugs according to the relative harms caused by each across three major categories of harm—(1) physical harm to the individual user; (2) the tendency of the drug to induce physical and psychological dependence; and (3) social harm, defined as the effect of drug use on families, communities, and society. Nutt et al., *Development of a rational scale to assess the harm of drugs of potential misuse*, 369 Lancet 1047 (2007) (hereinafter "Nutt et al. Study"). With respect to the second category, which measured addiction potential, the researchers found that powder cocaine is approximately twice as likely to cause both physical and psychological dependence as is MDMA. *Id.* at 1051. More significantly, MDMA consistently ranked in the bottom quartile of all three major categories of harm, whereas powder cocaine ranked in the top quartile for all three categories and earned the second-highest mean harm score of all twenty drugs, after heroin. *Id.* at 1050.

Despite the myriad ways in which MDMA is less harmful than cocaine, the Commission focused on the few ways in which it is more harmful than cocaine to support a higher ratio. As noted, the Commission relied on: (1) MDMA's potential neurotoxicity; (2) the fact that it is more aggressively marketed to youth; and (3) its alleged status as a combined stimulant and hallucinogen. Although certain of these findings remain valid (or at least have not been disproved), others have been weakened by recent research.

Experts for both parties at the *McCarthy* evidentiary hearing testified that the Commission incorrectly categorized MDMA as a hallucinogen. *McCarthy*, 2011 WL 1991146 at *5. Moreover, "comparing pharmacological properties using broad descriptors like 'stimulant' and 'hallucinogen' says little—if anything—about the relative harm posed by a drug." *Id.* To the extent that the Commission's assumption about MDMA's hallucinogenic properties factored

into its Guideline recommendation, that Guideline "rests on assumptions about . . . relative harmfulness . . . that more recent research and data no longer support." *Kimbrough*, 552 U.S. at 98.

However, the other two factors cited by the Commission—potential neurotoxicity and aggressive marketing to youth—remain countervailing considerations that counsel in favor of retaining some parity with the 200:1 cocaine-to-marijuana equivalency.

Whether MDMA is in fact neurotoxic remains a matter of debate in the scientific community. Although the Commission cited MDMA's potential neurotoxicity as a reason it is more harmful than cocaine, it recognized the disagreement among researchers as to whether MDMA is neurotoxic, and if so, whether that neurotoxicity is meaningful or permanent.[4] Report 8-9. Ultimately, however, the Commission credited the studies that reported toxicity to serotonin, a neurotransmitter in the brain, as well as those studies that found significant memory impairment resulting from MDMA use. A recent peer-reviewed study indicates that MDMA does cause at least some depletion in the levels of serotonin neurotransmitters in the brain, although it found less depletion that was found by the earlier studies relied on by the Commission.[5] *McCarthy*, 2011 WL 1991146 at *4; *see also* Baumann et al., *N*-Substituted

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[4] The Commission credited several MDMA toxicity studies that reported depletion in serotonin levels and toxicity to serotonin neurons in MDMA users. *Id.* However, it noted that "[t]he potential toxicity to serotonin neurons . . . has been the subject of some disagreement." *Id.* at 8. It also acknowledged that "some have suggested that the brain's elasticity and redundancy may mean that any neurotoxicity caused by the drug may not be meaningful," *id.* at 9, and that "[a]nother point of controversy . . . is whether loss of these serotonin sites, and the corresponding impairment, is permanent." *Id.* at 10.

[5] Experts for both parties at the *McCarthy* evidentiary hearing testified that "the best and most recent study of MDMA's effects on serotonin transporters found a reduction in serotonin transporters, but only in the cerebral cortex and hippocampus. . . . Importantly, the [study] expressly noted that it 'did not find a global, massive reduction of brain [serotonin transporter] binding as reported in the [primary study relied upon by the Commission].'" 2011 WL 1991146 at *4 (quoting S.J. Kisch et al., Decreased Cerebral Cortical Serotonin Transporter Binding in

Piperazines Abused by Humans Mimic the Molecular Mechanism of 3,4-Methylenedioxymethamphetamine (MDMA, or 'Ecstasy'), 30 Neuropsychopharmacology 550 (2005) (noting that data suggests neurotoxicity to animals after high-dose administration of MDMA, as manifested by tissue depletion, enzyme inactivation, and loss of neurotransmitter receptors). Recent studies also support the Commission's findings on the negative effects of MDMA on cognitive functioning; researchers have found that use of the drug "can cause statistically significant (although relatively minor) impairment in memory . . . ." *Id.*; *see also* Baumann et al. Study at 550 (noting that "habitual users of MDMA exhibit psychological problems, memory disturbances, and cognitive impairments"). Despite the lack of consensus on the extent to which MDMA may cause brain damage, the weight of the evidence supports the Commission's conclusion that MDMA is neurotoxic. *See id.* at *5.

Recent evidence also supports the Commission's finding that MDMA is more aggressively marketed to youth than is cocaine. Data from the 2010 National Survey on Drug Use and Health shows that as between MDMA and cocaine, MDMA is more prevalent among youth (defined as individuals between the ages of 12 and 17). U.S. Dep't of Health & Human Servs., Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings 52 (2010) (hereinafter "2010 Survey"). Among 12 to 17 year olds, 0.5 percent used MDMA in 2010, compared to 0.2 percent who used cocaine. *Id.* at 16. Moreover, the age at which youth first use MDMA is decreasing. For example, in 2010, the average age at first use among recent cocaine initiates was 21.2 years, a statistic that has remained fairly stable since 2002. *Id.* at 52. By contrast, the average age at first use among recent MDMA initiates in 2010 was 19.4 years, which was lower than the average in 2002 (21.2 years). *Id.*

Ecstasy Users: A Positron Emission Tomography/[(11)C] DASB and Structural Brain Imaging Study, 133 Brain 1779, 1791 (2010)).

The data also shows that MDMA use in general is increasing among the youth population over time. Historically, use of MDMA declined from 0.5 percent of individuals aged 12 to 17 in 2002 to 0.3 percent in 2004-2007, but increased back to 0.5 percent in 2009 and 2010. *Id.* at 16. In 2010, among persons aged 12 or older, the number of first-time past year MDMA users who initiated use prior to the age of 18 was 382,000. *Id.* at 52. This is significantly higher than the 2005 estimate (209,000 users). *Id.* By contrast, only 0.2 percent of youths aged 12 to 17 were users of cocaine in 2010, down from 0.6 percent in 2005. *Compare* 2010 Survey 52 *with* U.S. Dep't of Health & Human Servs., Results from the 2005 National Survey on Drug Use and Health: Summary of National Findings 17 (2005) (hereinafter "2005 Survey"). In 2010, among persons aged 12 or older, the number of first-time past year cocaine users who initiated use prior to the age of 18 was 180,908, which is significantly lower than the 2005 estimate (328,744 users). *Compare* 2010 Survey 52 *with* 2005 Survey 48-49.

This Court recognizes the serious risks of harm posed by MDMA. Its potential neurotoxicity, coupled with its popularity among youth, is of particular concern. The scientific evidence existing at the time of the Act's passage surely warranted an increase in the penalty structure for MDMA-related offenses. However, the 500:1 marijuana equivalency ultimately chosen by the Commission does not accurately reflect the then-existing research, nor is it supported by more recent evidence. The Court therefore adopts a 200:1 MDMA-to-marijuana equivalency.[6]

[6] The *McCarthy* decision recognized that, because much of the evidence indicates that MDMA is less harmful than cocaine, a lower equivalency may be warranted "given a sufficient factual foundation." 2011 WL 1991146 at *8 n.2. Although such a foundation is lacking here, the Court agrees that an equivalency lower than 200:1 may be appropriate if additional research further calls into question the Commission's analysis.

III. Determining the Most Closely Related Controlled Substance

A. Applicable Law

Where an offense involves a controlled substance that is not specifically referenced in the Guidelines, a sentencing court must determine the base offense level using the marijuana equivalent of the "most closely related controlled substance [that is] referenced" in the Guidelines. U.S.S.G. 2D1.1 cmt. n.5. The Guidelines provide that, in order to determine the most closely related controlled substance, the Court consider, to the extent practicable, the following factors: (A) Whether the controlled substance not referenced in this guideline has a chemical structure that is substantially similar to a controlled substance referenced in this guideline; (B) Whether the controlled substance not referenced in this guideline has a stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance referenced in this guideline; and (C) Whether a lesser or greater quantity of the controlled substance not referenced in this guideline is needed to produce a substantially similar effect on the central nervous system as a controlled substance referenced in this guideline." *Id.* Although a court is required to carefully consider these factors, in certain cases it may lack sufficient data to match substances with scientific precision. *See United States v. Chowdury*, 639 F.3d 583, 586 (2d Cir. 2011) ("The statute explicitly requires that the sentencing judge consider the enumerated factors 'to the extent practicable,' thus recognizing that, in some circumstances, sentencing courts will be unable to match substances under each of the factors.") (internal citation omitted).

B. Analysis

The majority of the substance involved in the present case was not MDMA. The offense involved 313 grams of a mixture containing BZP and TFMPP, a noncontrolled substance,[7] and

[7] In 2002, the DEA temporarily controlled TFMPP as a Schedule I hallucinogen because of its

only .73 grams of a mixture containing MDMA.[8] Because BZP is a controlled substance that is not specifically referenced in the Guidelines, the United States Probation Office ("Probation") calculated Qayyem's base offense level by using the marijuana equivalent of the most closely related controlled substance referenced in the Guidelines, which it determined was MDMA.[9]

Qayyem argues that the Court should use amphetamine, and not MDMA, as the most closely related controlled substance for the BZP pills, based on the DEA's determination that "the controlled substance for which a sentencing guideline equivalency exists that is most closely analogous to BZP [is] d-amphetamine." Correction to Schedules of Controlled Substances, 75 Fed. Reg. 47,451-52 (Aug. 6, 2010) (to be codified at 21 C.F.R. pt. 1308). However, although amphetamine is the most closely related controlled substance to BZP *in isolation*, the weight of the evidence suggests that BZP, *when used in combination with TFMPP*, is more closely analogous to MDMA.[10]

With respect to the first factor under § 2D1.1—chemical structure—there is no evidence to indicate that any referenced controlled substance bears a substantial similarity to BZP-TFMPP, including MDMA. *See* Baumann et al. Study at 55, Fig. 1 (comparing the chemical

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abuse potential and lack of accepted medical use or safety. TFMPP was reverted to non-control status in 2004 based on a scientific and medical evaluation conducted by the Food and Drug Administration and the National Institute on Drug Abuse.

[8] As noted, although the DEA did not measure the precise quantity of TFMPP contained in the pills, Qayyem concedes that the pills did contain that substance.

[9] This is consistent with Qayyem's plea agreement, which stipulated that the MDMA guidelines would apply to the pills containing BZP and TFMPP.

[10] Other federal courts considering the issue have also found that the combination of BZP and TFMPP is most closely related to MDMA. *See, e.g.*, *United States v. Chowdury*, 639 F.3d 583, 589 (2d Cir. 2011) (holding that it was not procedural error for district court to conclude that MDMA is the appropriate substitute for BZP-TFMPP combination); *United States v. Rose*, 722 F. Supp. 2d 1286, 1289 (M.D. Al. 2010) ("While BZP on its own may arguably be most similar to amphetamine, BZP-TFMPP is most 'closely related' to MDMA, albeit less potent"); *United States v. Beckley*, 715 F. Supp. 2d 743, 749 (E.D. Mich. 2010) (concluding that MDMA is the most closely related controlled substance to BZP-TFMPP).

structure of MDMA, a ring-substituted amphetamine, with those of BZP and TFMPP, which are *n*-substituted piperazines). Other courts that have held evidentiary hearings on the issue have also concluded that BZP-TFMPP is not structurally similar to any controlled substance referenced in the Guidelines. *See, e.g.*, *United States v. Rose*, 722 F. Supp. 2d 1286, 1289 (M.D. Al. 2010); *United States v. Beckley*, 715 F. Supp. 2d 743, 748 (E.D. Mich. 2010).

However, the second factor under § 2D1.1—whether the drugs have substantially similar effects on the central nervous system—strongly supports a finding that MDMA is the most closely related controlled substance to BZP-TFMPP. Research shows that BZP and TFMPP are often abused in combination because, when used together, they mimic the effects of MDMA at a molecular level. MDMA intake increases levels of brain neurotransmitters serotonin and dopamine. When administered in combination, BZP and TFMPP have the same effect, albeit with a lesser potency.[11] Baumann et al. Study at 558 ("The ability of the BZP/TFMPP combination to produce simultaneous elevations in extracellular [dopamine] and [serotonin] . . . mimics the known molecular mechanism of MDMA. Thus, we suspect that stimulatory effects of BZP/TFMPP on monoamine release might underlie the evolving misuse of these agents in

[11] Although an extended discussion of the molecular mechanisms by which these drugs operate is beyond the scope of this opinion, readers may find helpful the following overview of the results of the Baumann et al. Study. *In vivo* administration of MDMA produced dose-related elevations in levels of serotonin and dopamine, both of which are monoamine neurotransmitters. Baumann et al. Study at 553. As between dopamine and serotonin, the effects of MDMA on serotonin were predominant. *Id.* *In vivo* administration of BZP, in isolation, also produced dose-related elevations in dopamine and serotonin, but the effects of the drug on dopamine were predominant. *Id.* BZP was approximately three-fold less potent than MDMA as a dopamine releaser, and much less potent as a serotonin releaser. *Id.* at 554. *In vivo* administration of TFMPP, in isolation, produced a significant elevation in serotonin, but had no effect on dopamine, and its effect on serotonin was at least three times less potent than MDMA. *Id.* In other words, BZP is a low-potency dopamine releaser, whereas TFMPP is a low-potency serotonin releaser. When BZP and TFMPP were administered together, in a 1:1 ratio, they produced dose-related elevations in both dopamine and serotonin. *Id.* The low-dose administration of the BZP/TFMPP combination "produced simultaneous release of [dopamine] and [serotonin] that was qualitatively and quantitatively similar to the neurochemical effects produced by low-dose MDMA." *Id.* at 557. The study concluded that the "monoamine-releasing properties of BZP/TFMPP could be involved with the reported MDMA-like psychoactive effects of this drug combination, thereby contributing to the evolving misuse of these piperazines." *Id.* It should be noted, however, that the study found that the low-dose administration of BZP/TFMPP differed from the low-dose administration of MDMA insofar as it impacted motor activity differently; MDMA elicited "robust locomotor stimulation" whereas BZP/TFMPP did not elicit robust motor activity. *Id.* In this respect, the behavioral effects of the two drug types may be different.

humans."); *see also* Thompson et al., Report for the Ministry of Health, The benzlypiperazine (BZP)/trifluoromethylphenylpiperazine (TFMPP) and alcohol safety study 5 (2006) (adopting conclusions of Baumann et al. Study).

The research is consistent with law enforcement reports that BZP-TFMPP has gained popularity as an alternative to MDMA. The DEA called attention to this fact in 2004, when it added BZP to the list of Schedule I controlled substances: "BZP has increasingly been found in similar venues as the popular club drug MDMA (also known as Ecstasy). BZP, often in combination with TFMPP, is sold as MDMA, promoted as an alternative to MDMA and is targeted to the youth population." Schedules of Controlled Substances, 69 Fed. Reg. 12794-01, 12795 (Mar. 18, 2004). More recent reports confirm that BZP-TFMPP continues to be marketed as MDMA or as an alternative to MDMA. In October 2011, the DEA issued a report on TFMPP, stating that the drug "is being promoted as a legal alternative to MDMA at raves (all-night dance parties) as TFMPP or 'Molly' and is often sold in combination with BZO as 'ecstasy', or 'A2', 'legal E' or 'legal X' in order to enhance its spectrum of effects." Drug Enforcement Admin., TFMPP Report, October 2011, *available at* http://www.deadiversion.usdoj.gov/drugs_concern/tfmpp.pdf. The report also noted an escalation in the abuse of TFMPP "as evidenced by the increasing encounters of this substance by law enforcement officials." *Id.*; *see also* U.S. Dep't of Justice, Drug Alert Watch: BZP/TFMPP Combination Tablets Marketed as MDMA, April 7, 2010, *available at* http://www.justice.gov/ndic/pubs40/40706/sentryWatch003_BZP0407p.pdf (last visited on Jan. 5, 2012) (reporting sales of BZP-TFMPP marketed to "unsuspecting abusers" as MDMA and citing Baumann et al. Study for proposition that combination of BZP and TFMPP mimics MDMA's molecular mechanism).

The facts of the current case also support a finding that the intended neurological effects of MDMA and BZP-TFMPP are similar. Qayyem's co-conspirator first sold to the confidential informant three "sample" pills containing MDMA, and although the subsequent two "bulk" sales totaling 1,055 pills consisted solely of BZP and TFMPP, they were presented as sales of ecstasy. *Cf. Chowdury*, 639 F.3d at 586 ("The fact that the pills confiscated from [defendant] were initially identified by . . . agents as MDMA and have a 'street price' similar to that of MDMA lends further support to the conclusion that their intended neurological effects are similar.")

Finally, the third factor requires the Court to consider the relative potency of the referenced and non-referenced substances. Current evidence suggests that BZP-TFMPP may be less potent than MDMA. *See* Baumann et al. Study at 554 (finding that *in vitro* administration of BZP-TFMPP was "somewhat less potent" than MDMA with respect to stimulating monoamine release).[12] However, it is not clear what amount of BZP-TFMPP is necessary to produce a substantially similar effect as that caused by MDMA, and it appears that the question has yet to be fully examined by researchers. Nevertheless, the lack of data on this point is insufficient to preclude the Court from finding that MDMA is the most closely related controlled substance. *See Chowdury*, 639 F.3d at 586 (upholding district court's determination that MDMA is the most closely related controlled substance even "in the absence of . . . reliable information regarding the relative potency of the two substances"). Moreover, the relative potency of two narcotics is appropriately considered as part of a court's 18 USC § 3553(a) analysis. *Chowdury*, 639 F.3d at 586. In this instance, the potency differential between equivalent amounts of BZP-TFMPP and MDMA may warrant a downward variance. *See id.*; *Rose*, 722 F. Supp. 2d at 1291 (granting

[12] However, the results with respect to *in vivo* release indicated that, at least at low dosages, BZP-TFMPP and MDMA produced "quantitatively similar" effects. Baumann et al. Study at 557. For example, a 3-milligram administration of BZP-TFMPP in a 1:1 ratio caused a slightly lower increase in serotonin, but a slightly higher increase in dopamine, than a 3-milligram administration of MDMA. *Id.* at Figs. 4, 10. It should also be noted that in isolation, BZP and TFMPP are each approximately three times less potent than MDMA. *Id.* at 556.

variance where diminished potency of BZP-TFMPP relative to MDMA was not accounted for in calculating defendant's offense level).

Therefore, after considering the available evidence in light of the factors outlined in §2D1.1, the Court concludes that MDMA is the most closely related controlled substance to a BZP-TFMPP combination.[13]

IV. Conclusion

For the foregoing reasons, the Court: (1) adopts an MDMA-to-marijuana equivalency of 200:1, and (2) finds that MDMA is the most closely related controlled substance to a mixture of BZP and TFMPP. The Court will sentence Qayyem in accordance with these rulings.

SO ORDERED.

Dated: New York, New York
January 10, 2012

Kimba M. Wood
United States District Judge

[13] Qayyem argues that the Court needs to know the specific ratio of BZP to TFMPP in order to make a "meaningful comparison" between the pills in this case and the pills in other cases where courts have ruled that MDMA is the most closely related controlled substance. The Court rejects this argument. "Requiring the Government to set forth the precise ratio of BZP to TFMPP in each pill recovered in this case would impose a greater evidentiary burden than it must bear, especially when considering all of the evidence in its totality. . . . The language of [§ 2D1.1] and the applicable evidentiary burden suggest that the Court is not required to find a drug that is exactly the same as BZP-TFMPP with scientific precision." *Beckley*, 715 F. Supp. 2d at 749.